

ABSTRACT

A preferred apparatus and method is presented in which a distributed fiber optic sensor is used in order to detect a disturbance along its length. A pulse of polarized light is launched into an optical fiber; as the pulse propagates along the optical fiber, it continuously loses a small portion of its energy due to Rayleigh backscatter. The Rayleigh backscattered light is analyzed using a polarisation sensitive element such as a fiber polarizer. The dynamics of the time dependence of the polarization analyzed backscattered light is used to ascertain if there has been a disturbance along the length of the optical fiber. This technique can be used for applications in areas such as fiber optic telecommunications, perimeter security, fire detection, and pipelines.